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A merit pay allocation model for college faculty based on performance quality and quantity

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Abstract

The salary of most college and university faculty in the United States is based on merit and market factors, rather than on a fixed scale. This article proposes a structured model for faculty performance evaluation that explicitly considers both quality and quantity of faculty output in the areas of teaching, scholarship, and service. Detailed criteria for measuring the quantity of performance outputs and for assigning quality weights are presented. The model allows faculty to emphasize different aspects of their work, e.g. teaching or scholarship. The model proposes merit pay allocation in proportion to a faculty member's contribution to a department's overall performance output. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The salary of most college and university faculty in the United States is based on merit and market factors, rather than on a fixed scale. In light of the increasing public awareness of value for money in higher education and a growing emphasis on accountability by administrators and faculty, this is likely to remain so for the foreseeable future. Typically, depending on the availability of funds, each year a pool of money is designated to adjust faculty compensation, where the distribution of the money among the faculty is based on performance in the preceding year. Performance normally takes into account the faculty member's teaching record, scholarship output, and service activities, where the emphases placed on these three aspects differ from school to school and department to department. Also, within each of the

three areas, the specific criteria used for evaluation, and the weights placed on them vary greatly. Faculty in different disciplines and at different institutions have different work responsibilities and the systems that reward them are also different (Braskamp & Ory, 1994). Some schools or departments do not use explicitly defined criteria, but rather rely on end of the year evaluations based upon the observations and feelings of the administrators in charge. This may not be the best approach though, as faculty should have some knowledge of the evaluation process in order to direct their efforts accordingly (Miller, 1972). A number of studies have been published that deal with faculty performance evaluation (for example Arreola, 1979; Brown, 1984; Centra, 1994; Sapone, 1980), but most stop short of proposing specific techniques or formulas for allocating merit pay (Camp, Gibbs & Masters, 1988). Some deal only with specific areas of performance evaluation, such as teaching. Clearly, there is not going to be one model that ideally fits every institution, discipline, and department. But reasonably flexible models for evaluating performance and allocating merit funds can be developed that will fit

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a range of departments in various institutions and disciplines.

The current paper proposes such a model. The model provides structure to the evaluation and allocation processes, while allowing variability in the weights attached to the components that make up a faculty member's work load, and by leaving the dean or chairperson that is in charge of these processes a fair amount of flexibility in applying the model. This discretionary power is considered important in order to allow factors not explicitly covered in the model to enter the evaluation process.

The proposed model differs from previously published ones in that it explicitly considers both the quality and the quantity of a faculty member's output in each of the areas of teaching, scholarship and service, and in that it allows individuals to place different emphases on each of these three areas, depending on what each faculty member is best at. The model also provides a mechanism for transforming the performance results into merit increases in a way that rewards high performers while controlling extremes at either end of the spectrum.

2. Overview of the proposed model

As stated earlier, the emphases placed on teaching, scholarship, and service may differ from school to school or department to department, depending on their specific missions. However, even within a department it is not mandatory that each individual faculty member devote his or her time equally to these three areas. Some faculty members are highly successful scholars and should probably continue to place high emphasis on this aspect of their work. Other faculty members may be extremely effective teachers and wish to spend a larger proportion of their efforts in this area. Still others may be very involved in service activities, either within the institution, or in professional societies or on journal boards. Such flexibility is desirable to allow faculty members to do what they are best at, as long as on average the department meets its goals with respect to teaching, scholarship and service. The proposed model allows faculty to select their focus, recognizing that faculty differ in aspirations and abilities. Thus, a specific department may have as its goal to devote collectively 40% of its efforts on scholarship, 40% on teaching and 20% on service. Even if some faculty may wish to spend 50% of their effort on teaching, 30% on scholarship, and 20% on service, and others may wish to spend 30% of their effort on teaching, 50% on scholarship, and 20% on service, the department goal can be reached as long as the mix of faculty emphases is right. The individual percentages of effort may be established by the faculty member in consultation with the chair or dean, to reach a work plan that is acceptable to the faculty member while allowing the school or department to achieve its goals

and objectives. The percentages used above are just for illustration. The proposed model should work with any percentages deemed desirable by the department and faculty.

Irrespective of the individual work plans and the associated emphases in different areas that faculty have developed in consultation with the chair or dean, each faculty member is evaluated separately on scholarship, teaching, and service performance. These evaluations are based on both quality and quantity, as outlined later in this paper, separately in each of these three categories. Basically, the information on quantity is provided by the faculty members, together with any documentation that would allow the evaluator to judge the quality of the work performed. The actual quality rating is done by the evaluator, i.e. the chair or dean or whoever it may be. The sum of products of quantities and quality ratings make up the 'output' of a faculty member in each of the areas of teaching, scholarship, and service.

These individual outputs are translated to a one to ten scale, as described later. Using a one to ten range, rather than an open scale, prevents faculty with extreme output performance from taking a too large share of the pot, while also preventing faculty that had a "bad" year from ending up with nothing. The fairness of this approach can be debated, but it is the authors' feeling that with limited raise money available, it must be ensured that good performers nevertheless get a reasonable raise, irrespective of the presence of one or two star performers in the department. Also, faculty that have a one time bad year should not be punished excessively, considering that the amount of merit raise money differs from year to year. It would seem unfair if a person happens to have a bad year when a relatively large amount of raise money is available, and has a good year when no or very little money is available. Faculty who consistently perform below acceptable levels may be dealt with otherwise, such as counseling on improving performance, and if that does not help, probation and eventually termination.

The individual faculty ratings in the three areas of scholarship, teaching, and service are combined to an overall rating, by applying weights corresponding to the established percentage efforts of emphases in these three areas. Each faculty member's final, combined rating, relative to the total over all faculty in the department or school, may be taken to represent that faculty member's share of the total pool of money available for merit based salary adjustments. The chair or dean may adjust final ratings in cases of special circumstances, such as sabbaticals or prolonged illness.

Unlike the model of Camp, Gibbs and Masters (1988), the proposed model does not take base salary into account. Though the authors agree that salary compression may result when base salary is not taken into consideration, there are a few arguments against such use. First, at some institutions and in some fields, due to

the hiring of new faculty at market salaries, the problem is less one of salary compression than of salary reversion: some newly hired assistant professors actually have higher base salaries than some associate and full professors with extensive experience. Due to family circumstances these senior faculty often are not in a position to move elsewhere to achieve a market salary. Second, it can be argued that ‘merit’ raises should be based on merit alone. Cost-of-living raises, on the other hand should be percentage increases of base salary. If such cost-of-living raises are intended, then the pool of raise money can be divided into two separate pots, where the model proposed in this paper would only be applied to the ‘merit’ pot.

3. Evaluation of performance

3.1. Teaching

For each faculty member, let:

- $T1_k$ = # of undergraduate (3 credit hour) courses taught during year (sections with near 60 students count as 1.5 courses, sections with near 100 students count double); summer courses and courses taught off load for extra pay, are not counted).
- $T2_k$ = # of graduate (3 credit hour) courses taught during year (summer courses and courses taught off load for extra pay, are not counted).
- $T3_k$ = # of course preparations during year (i.e. number of different 3 credit hour courses taught during year; summer courses and courses taught off load for extra pay, are not counted).
- $T4_k$ = # of new courses taught during year (i.e. number of 3 credit hour courses taught that this faculty member had not taught within the previous two academic years; summer courses or courses taught off load for extra pay, are not counted).
- $T5_k$ = # of course developments during year, i.e. developments of courses that were not previously part of the curriculum, or developments of revolutionary new teaching approaches or methods for existing courses.
- $T6_k$ = # of independent study projects at the undergraduate or graduate level, during academic year (if done above normal teaching load and without extra pay; credit for a project may only be claimed once, even if the project stretches over multiple terms or years).
- $T7_k$ = # of new thesis and dissertation committees to which the faculty member was appointed during the past academic year (credit for serving

on a specific committee may only be claimed in the year of initial appointment); serving as assistant chair of a committee counts double, and chairing a committee counts triple.

$T8_k$ = # of thesis and dissertation committees on which the faculty member served and that were completed successfully during the past academic year; double credit is given for serving as assistant chair of a committee, and triple credit is given for chairing a committee.

The teaching rating is based on quality and quantity. Each value above ($T1_k$ – $T8_k$) is multiplied by a quality weight ($w1_k$ – $w8_k$, where a weight of 5 indicates exceptional quality, a weight of 3 indicates average quality, and a weight of 1 indicates below average quality) determined by the department chair or school dean. Quality in class room teaching shall be based on student evaluations (consideration should be given to the open ended comments made by students; the use of averages of closed ended questions should be avoided), peer evaluations (if available), quality of syllabi and other course materials, and school, university, and external recognitions (formal awards as well as other indicators, such as frequent invitations to conduct seminars in the faculty member’s area of expertise). Student evaluations must be examined with caution; while consistent negative evaluations are reason for concern, consistently glowing evaluations combined with consistently higher than average grade point distributions may also be reason for concern. Teaching quality is not generally expected to oscillate dramatically from one semester to another, and should be evaluated over a longer period of time. Willingness of faculty to adjust to the needs of the department or school (e.g. teaching less preferred courses, teaching at less preferred times, participating in experimental teaching methods such as distance learning, team teaching, teaching off campus, etc.), should also be considered in determining the quality weights. Where reference is made to 3 credit hour courses, proportional credit is given for courses of fewer or more credit hours.

Individual teaching ‘output’ is then determined as:

$$T_k = t1 w1_k T1_k + t2 w2_k T2_k + t3 w3_k T3_k + t4 w4_k T4_k + t5 w5_k T5_k + t6 w6_k T6_k + t7 w7_k T7_k + t8 w8_k T8_k$$

where $t1$ – $t8$ represent the relative importance attached to each of the eight teaching components. As a result of deliberations among the authors and other faculty in our department, the authors suggest $t1=1$, $t2=1.1$, $t3=0.3$, $t4=0.2$, $t5=0.3$, $t6=0.1$, $t7=0.2$, and $t8=0.2$. Clearly, other coefficient values could be used.

3.2. Scholarship

Scholarship comprises basic scholarship, applied scholarship and instructional development. Faculty scholarship activity is divided into four categories, as described below. In cases where there is uncertainty in selecting the appropriate category for a faculty member's work, the faculty member is expected to provide supporting evidence to the department chair or school dean to justify a higher category. In order to spread the reward for publishing success over a longer period than one year, credit is given twice for publications in journals in Categories 1 and 2: once when the article has been accepted, and a second time when it has appeared in print. Should an article appear in print the same assessment period in which it was accepted for publication, the affected faculty member may choose to have it counted twice for that assessment period, or have it counted once in the current period and once in the following assessment period.

3.2.1. Category 1: accepted or published articles in academic journals and external research grants

This category consists of publications in journals that are generally recognized to be at the leading edge of their disciplines as judged by the scholars who read these journals and conduct research in these disciplines. Usually these journals are international in scope and are easily located in various indices. The review process for these journals is very rigorous: it normally involves two or more peer referees who are recognized as experts in the subject area, and who provide independent assessments to the editor (or an associate editor) of the journal. In addition to acceptances and publications in such journals, successful external funding research grants that have gone through a similar review process as outlined in this category may be deemed as Category 1 activities.

3.2.2. Category 2: accepted or published articles in other than Category 1 journals, and accepted or published books and book chapters

This category consists of publications in journals that are ordinarily national in scope in terms of authorship and readership, deal largely with practitioner issues, and are generally perceived to be below in stature (but not necessarily inferior in quality) to those of Category 1. Although there are exceptions, the review process for Category 2 publications is generally less rigorous than for Category 1 publications and is primarily dependent on the editor or an editorial board that lacks the degree of independence found in Category 1 journals. In addition to publications in these journals, innovative software for national exposure and consumption that has gone through the review process as outlined in this category, and invited keynote presentations at national/international meetings are deemed Category 2

activities. Moreover, scholarly books and contributions in scholarly books and textbooks that have gone through the appropriate review process are deemed Category 2 activities.

3.2.3. Category 3: articles in trade journals, national and international conference proceedings, internal research grants, and Categories 1 and 2 activities under review

This category consists of publications and presentations that are generally perceived to be considerably below in stature than those of Categories 1 and 2. Although there are exceptions, the review process is generally perfunctory. Typical activities include articles appearing in trade journals, in proceedings of national and international scholarly meetings, and research monographs. Internal funding for research, papers submitted to Category 1 or 2 journals, and submitted external research grant proposals also count as Category 3 scholarship.

3.2.4. Category 4: regional conference proceedings, working paper series

This category includes all scholarly activities that cannot be classified into one of the previous three categories. For example, regional conference proceedings, presentations, including presentations at faculty research seminars, professional growth activities, and manuscripts in working paper series are classified as Category 4 activities.

The scholarship rating is based on both quality and quantity. Each scholarship item is rated by the department chair or school dean as 'exceptional', 'normal', or 'below average' quality within its respective Category (Categories 1–4), corresponding to weights of 3, 2, or 1. While most items will be assigned a weight of 2, an item of exceptional quality in its Category (e.g. an article that has won a best paper award, or a book that promises to make a major contribution and required an extraordinary amount of time and effort to complete) will get a weight of 3, and items below average quality (e.g. a short research note as opposed to a full length paper in an academic journal) may get a weight of 1. Single authorship may also be recognized by a higher weight, and items with a large number of authors (four or more) may receive a lower weight.

Each individual faculty member's scholarship output, R_k , is determined as follows:

$$R_k = c_1 R_{1k} + c_2 R_{2k} + c_3 R_{3k} + c_4 R_{4k}$$

where R_{1k} , R_{2k} , R_{3k} , and R_{4k} are the weighted sums of activities in Categories 1, 2, 3, and 4, and c_1 , c_2 , c_3 , and c_4 represent the relative importances attached to the four categories. The authors suggest $c_1=0.5$, $c_2=0.3$, $c_3=0.15$, and $c_4=0.05$. These values evolved after much discussion

among the authors and with other faculty in our department. R_{1k} , R_{2k} , R_{3k} , and R_{4k} do not have to be integers.

3.3. Service

Although there are many ways to define service, we find the general definition suggested by Braskamp and Ory (1994, pp. 42–51) to be particularly effective. Service represents the work of the faculty members that is helping in the functioning of the university, in particular, and is providing expertise and knowledge to solve the problems of society and to serve the common good, in general. As such, it includes university service, service to the profession, public service, cooperative extension, and outreach. And, as Braskamp and Ory also suggest (1994, pp. 48–50), appropriate service implies that, in general terms, the faculty member is a good citizen to the university, to the profession, and to the community at large. With regard to the current model, service performance is partitioned into the following three categories: (1) direct university service or internal service, (2) service to the profession, and (3) community service. The model regards the first two to be of primary and equal importance as long as there is substantive internal service. That is, the absence of any meaningful internal service may be viewed as a negative in the overall assessment of service performance, even though there may be substantive service to the profession. The model regards community service to be of secondary importance. However, by adjusting appropriate weights, it is possible to give community service a higher weight than either internal service or service to the profession in assessing service performance.

3.3.1. Internal service (S_1)

This category includes activities such as (1) chairing or serving on department, school, or university committees, (2) advising student organizations, (3) performing administrative functions within the department, school, or university, and (4) providing any other worthwhile service to the department, school, or university.

3.3.2. Service to the profession (S_2)

This category includes activities such as (1) serving on academic editorial boards, (2) refereeing articles for academic and professional publications or conferences, and (3) active participation in academic and professional organizations, such as holding office and/or serving on boards or committees of such organizations, and organizing or chairing conferences or conference sessions.

3.3.3. Community service (S_3)

This category implies the application of the faculty member's expertise and knowledge beyond the boundaries of the university and the member's profession to provide assistance to and serve the common good of

society. As noted in Braskamp and Ory (1994, p. 47), such service may take various forms such as (1) providing technical assistance to public and private organizations, (2) conducting public policy analysis for local, state, national, and international governmental agencies, (3) appearing on television and at medial events, (4) testifying before legislative and congressional committees, and (5) serving as an expert for the press and other media.

In rating the faculty member's output with regard to these categories, the department chair or school dean must consider the following factors:

1. The extent of involvement and contribution made, including the amount of time spent as well as special responsibilities such as chairing an activity.
2. The quality and significance of the output of the service activity; that is, the accomplishments of the committee work or service activity.
3. The general disposition of the faculty member to support the interests of the department, school, and university, such as willingness to serve on ad hoc committees with short deadlines, or filling identified needs of the department, school, or university.

The department chair or school dean will assign each faculty member scores S_{1k} , S_{2k} , and S_{3k} , for internal service, service to the profession, and community service respectively, each on a scale of zero to ten, zero indicating minimal or no service performance, and ten indicating outstanding service performance. A weighted average service score for each faculty member is calculated as follows:

$$S_k = s_1 S_{1k} + s_2 S_{2k} + s_3 S_{3k}$$

The authors suggest coefficient values of $s_1=0.4$, $s_2=0.4$, and $s_3=0.2$, to reflect the greater importance attached to institutional and professional service, over community service at our university. This may not reflect the mission at other institutions, and different coefficients can be used.

4. Allocating merit pay

As described above, each faculty member receives an output rating T_k for teaching, R_k for scholarship, and S_k for service. These ratings are not on any specific scale, and their magnitudes may vary a lot. To translate these ratings to a uniform scale with limited variation, the following scheme is proposed:

In each of the three areas, scholarship, teaching, and service, calculate the means and the standard deviations of the ratings for all faculty. Add two and one half stan-

standard deviations to the means, to get values X, Y, and Z for scholarship, teaching, and service, respectively. The final ratings for each faculty member will be determined as

$$((T_k/Y) \times 9) + 1$$

$$((R_k/X) \times 9) + 1$$

$$((S_k/Z) \times 9) + 1$$

with maximum ratings of 10 in each of the three areas. This means that the rating 1 is assigned if the faculty members output in that area is zero, and the rating 10 is assigned if that faculty members output exceeds the mean over all faculty by two and one half standard deviations.

Each faculty member's three final ratings are combined to a single value, using weights representing their emphases in the areas of scholarship, teaching, and service, as stated at the beginning of the paper. The ratio of a faculty member's combined rating to the total over all faculty in the department or school, may be taken to represent that faculty member's contribution to the department or school in the preceding year. A faculty member's raise would be a corresponding portion of the total pool of money designated for merit based salary adjustments.

5. Application of the model

Four spreadsheets were developed, one each to compute the values T_k , R_k , and S_k (teaching output, scholarship output, and service output) for each faculty member (separate copies of the spreadsheets are required for each faculty member), and one more to calculate the final ratings and ratios for all faculty (only one copy is needed). Appendix A shows example spreadsheets for a hypothetical faculty member for teaching, scholarship, and service respectively, and Appendix B shows an example spreadsheet for calculating the overall departmental ratings and raises.

In the spreadsheet for teaching, the column 'number' is entered from the faculty member's annual performance activity report (PAR). The evaluator has to determine the quality weights based on the criteria described earlier in this paper. The spreadsheet calculates the 'number×weight' column and the 'points in category' column. The 'factor' column has been pre-entered into the template. The sum of the 'points in category' column yields the total teaching output for the faculty member.

In the spreadsheet for scholarship, only the columns 'Weight 3 items', 'Weight 2 items' and 'Weight 1 items' need to be completed by the evaluator. The items are taken from the faculty member's PAR in which they are listed by category, and the evaluator has to classify these items into one of the three columns, depending on the

assigned quality weights. The spreadsheet computes the weighted sum in the 'weighted points' column, which multiplied by the 'factor' column (pre-entered) yields the 'points in category'. The sum of the 'points in category' column yields the total scholarship output for the faculty member.

In the spreadsheet for service, the evaluator first completes the column 'Involvement (estimated total hours)' based on the PAR. Then, based on these estimated hours, together with other information on the services performed, such as the importance or significance of the service activities, the evaluator assigns a rating on the scale of one to ten for each of the three categories, service to the Department and University, service to the profession, and service to the community. The spreadsheet then calculates the 'points in category' column, using the pre-entered factors, and also calculates the total service output as the sum of the points in category column.

The first column in the department evaluations spreadsheet (Appendix B) identifies the faculty members of the department. The next three columns, teaching output, scholarship output, and service output, contain the results of the individual spreadsheets for teaching, scholarship, and service. For example, F7 contains the values derived for 'Dr John Jones' as shown in Appendix A. The next three columns, teaching rating, scholarship rating, and service rating, contain the ratings derived from applying the formulas $((T_k/Y) \times 9) + 1$, $((R_k/X) \times 9) + 1$, and $((S_k/Z) \times 9) + 1$, respectively, from the section on Allocating merit raises (the means, standard deviations, and X, Y, and Z values used in the calculation are shown at the bottom left below the spreadsheet). The teaching coefficients, scholarship coefficients, and service coefficients in the next three columns represent the emphasis weights for teaching, scholarship, and service, as they apply to the individual faculty members. The composite rating in the following column is derived as:

$$\begin{aligned} &\text{Teaching rating} \times \text{Teaching coefficient} \\ &+ \text{Scholarship rating} \times \text{Scholarship coefficient} \\ &+ \text{Service rating} \times \text{Service coefficient} \end{aligned}$$

The percentage of raise money column is calculated as the individual composite rating relative to the total composite rating (shown below the spreadsheet). The calculated raise, finally, is derived by multiplying the percentage of raise money for each faculty member by the total money available (i.e. \$75,000 in this hypothetical example, as shown above the spreadsheet).

6. Conclusion

In this paper a model for evaluating faculty performance in the areas of teaching, scholarship, and service,

and for translating these evaluations into merit raises has been presented. The model is based on the premise that faculty performance should be viewed as a product of quality and quantity. The model also takes into account that faculty may distribute their efforts differently among the areas of teaching, scholarship, and service, without detriment to the size of their merit raises, as long as their total output is equitable and the goals of the department or school are met. The model deals only with merit based raises, not with cost-of-living salary increases, though those can easily be accommodated by splitting the pool of raise money into separate amounts. The mapping of the performance outputs to a one to ten range is designed to lessen the effects of extreme performers on the raises of other good performers, and to lessen the impact on occasional poor performers.

Specific weights have been suggested in the model for the various activities in the three areas of teaching, scholarship, and service, however these weights can be modified to suit the specific environment and goals in other institutions, fields, or departments. The authors also believe that in any model, the evaluator must have some discretionary power to handle special circumstances that are not foreseen and accommodated in the model.

The model was used in the department that housed the authors. Prior to its actual usage, the model was illustrated to the faculty of the department using a realistic simulation. The use of the model was approved by the faculty.

The implementation of the model revealed the following important issues:

1. The model works well for faculty that are tenured or tenure-tracked and fit within the general parameters of teaching, research, and service.
2. The model does not work well for faculty who are heavily involved (if not entirely) in the teaching function, or faculty that are heavily involved in the service function, such as directors of institutes. The weights suggested by the model would create some inequities in this case.
3. The proper implementation of the model requires that all faculty report their activities in a format consistent with the model. It is the responsibility of the chair to make certain that all faculty wishing to be considered for a merit raise comply with the model's format.

The authors believe that, on balance, the strength of the model rests on the fact that it provides faculty an opportunity to clearly understand how they will be evaluated for merit increases, thus providing substantial light to a process that has traditionally been murky, at best.

Appendix A

Tables 1–3

Table 1

Teaching output for: Dr John Jones. Faculty track: S2 (scholarship emphasis)

	Number (from PAR)	Quality weight (1–5)	Number × weight	Factor	Points in category
T1	2	3	6	1	6
T2	2	1	2	1.1	2.2
T3	3	4	12	0.3	3.6
T4	1	3	3	0.2	0.6
T5	–		0	0.3	0
T6	–		0	0.1	0
T7	–		0	0.2	0
T8	3	3	9	0.2	1.8
Total teaching output: 14.20					

Table 2

Scholarship output for: Dr John Jones. Faculty track: S2 (scholarship emphasis)

	Weight 3 items	Weight 2 items	Weight 1 items	Weighted points	Factor	Points in category
Category 1		2	1	5	0.5	2.5
Category 2			2	2	0.3	0.6
Category 3	2	2	1	11	0.15	1.65
Category 4	1	2	3	10	0.05	0.5
Total scholarship output: 5.25						

Table 3

Service output for: Dr John Jones. Faculty track: S2 (scholarship emphasis)

	Involvement (estimated total hours)	Rating ^a (scale of 1–10)	Factor	Points in category (rating×factor)
Internal	175	9	0.4	3.6
Profession	85	6	0.4	2.4
Community	75	5	0.2	1.0
Total service output: 7.00				

^a In determining the Rating for each service category, the following should be taken into consideration: (a) the extent of involvement and contribution made (e.g. total hours and special assignments) (b) the quality and significance of the output of the service activity (c) the general willingness of the faculty member to support the interests of the Department, School, and University.

Appendix B. Department evaluations

Table 4

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